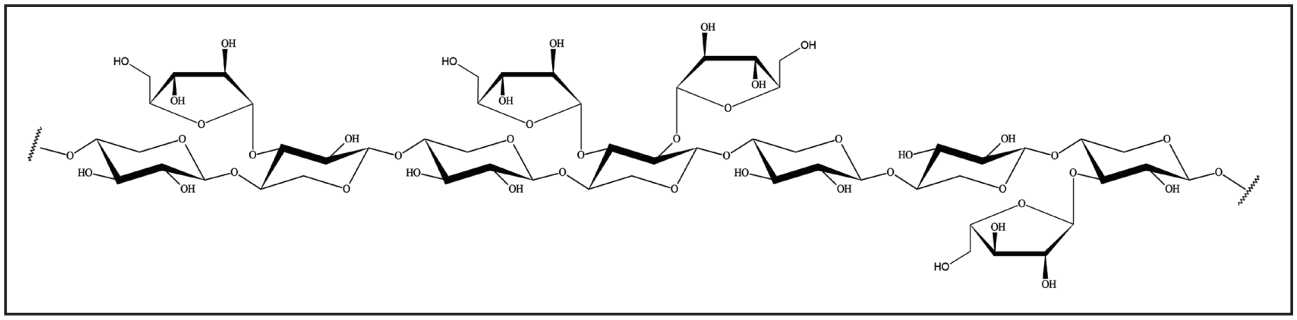
RYE ARABINOXYLAN (High Viscosity) (Lot 151209)

P-RAXY **09/18**
CAS: 9040-27-1

STRUCTURE



Schematic representation of rye arabinoxylan subunit

PROPERTIES

Purity:	~ 90% (dw basis)
Sugar Ratio:	Arabinose : Xylose = 40 / 60
Viscosity:	74 cSt (1% w/v; Ostwald C-type viscometer, 30°C)
Molecular Weight (Mw):	386 Kd (MAALS)
Starch content:	0.2%
Beta-Glucan:	0.1%
Protein:	3.7%
Moisture:	2.0%
Ash:	5.3%
Physical Description:	Slightly off-white, odourless powder

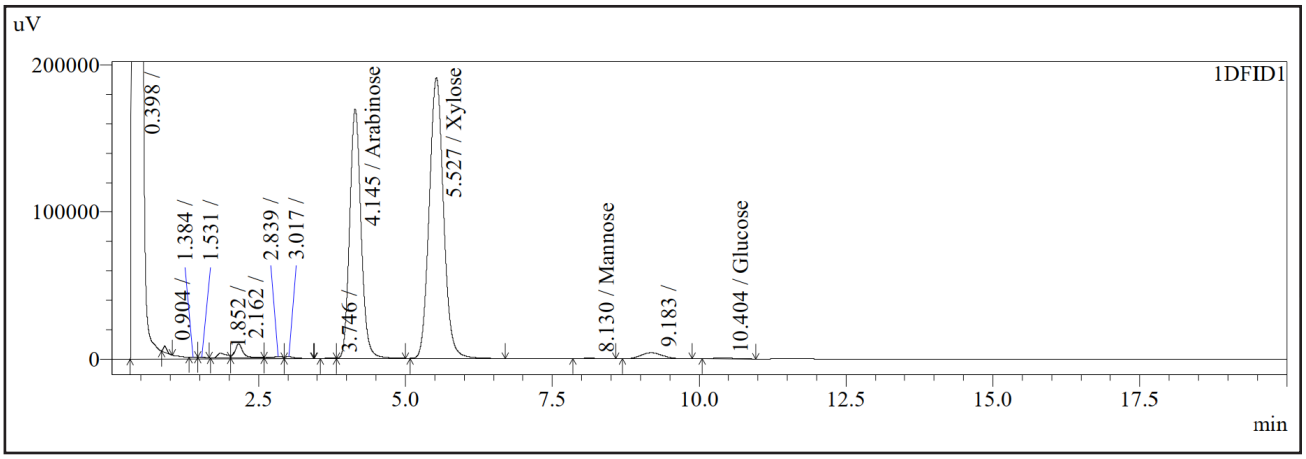
STORAGE CONDITIONS

Store dry at room temperature in a well sealed container. Under these conditions, the product is stable for several years.

METHOD OF DISSOLUTION (for 1% w/v solution)

Accurately weigh 1 g of arabinoxylan into a 120 mL dry pyrex beaker. Wet the sample with 8 mL of 95% ethanol. Add a magnetic stirrer bar, followed by 90 mL of distilled water. Immediately place the beaker containing the slurry on a magnetic stirrer-hotplate and heat at a setting of 100°C with vigorous stirring. Loosely cover the beaker with aluminium foil and stir and boil the contents until the arabinoxylan completely dissolves (approx. 10 min). Allow the solution to cool to room temperature with continued stirring. Adjust the volume to 100 mL. The solution may be very slightly opalescent due to the presence of trace amounts of protein. Arabinoxylan solutions can be stored at room temperature for several weeks in a well sealed storage bottle. Microbial contamination is prevented by adding a few drops of toluene to the storage bottle.

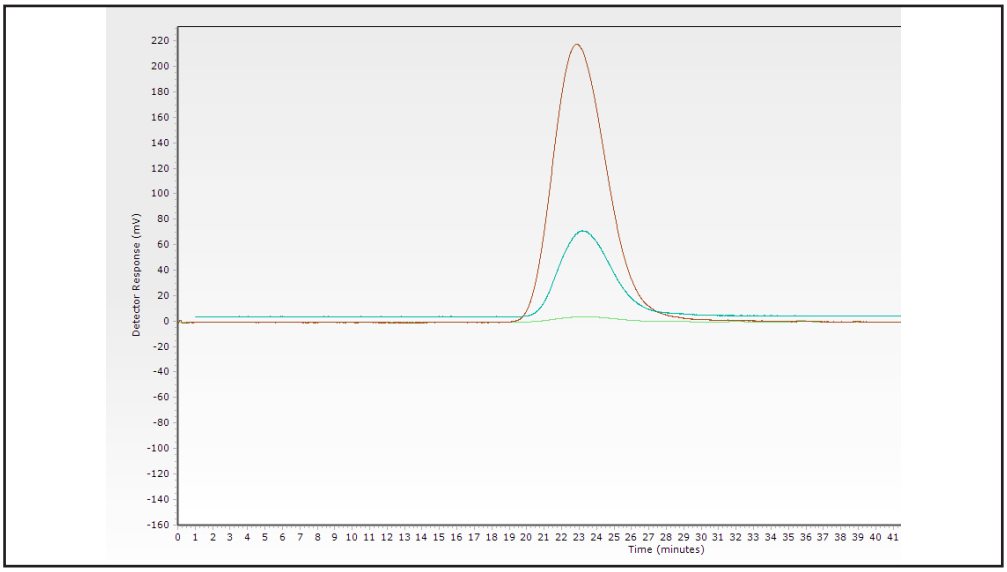
Gas liquid chromatography of the alditol acetates derived from hydrolysis and derivatisation of high viscosity rye arabinoxylan (Lot 151209)



GLC

A typical polysaccharide sample (~ 10 mg) was hydrolysed using 2N TFA at 120°C for 60 min. Subsequent sodium borohydride reduction was performed in 1N NH_4OH for 90 minutes at 40°C. The corresponding alditol acetates were prepared using acetic anhydride and 1-methyl imidazole, extracted into DCM and analysed by GC. Chromatography was performed on a Shimadzu GC-14B with CHROMATOPACK C-R8A using a Packed glass column (6 ft x 5 mm OD, 3 mm ID) with 3% Silar 10C on W-HP (80-100 mesh). The carrier gas was nitrogen at 130 KPa. Injector temperature; 250°C; Column temperature 230°C. Detection by FID with 60KPa H_2 pressure and 50 KPa air pressure.

Size Exclusion Chromatography of high viscosity wheat arabinoxylan (Lot 151209)



Polysaccharide & Lot Number	Mp	Mw	Mn	Pd
Rye Arabinoxylan Lot 151209	350897	385986	197912	1.83

VISCOTEK ANALYSIS

Polysaccharide Solubilisation Protocol

10 mg of the polysaccharide were weighed into a glass test tube. 10mL 0.1 M $NaNO_3$ containing 5 mM NaN_3 (GPC-SEC eluent) was added to give a polysaccharide concentration of ~ 1 mg/mL. The samples were sealed and stirred for 2.5 h at 90°C. After cooling to RT, the solutions were filtered through a 0.2 µm filter and analysed. This protocol was repeated on two separate samples.

Size Exclusion Chromatography

GPC/SEC chromatography was performed on an Agilent 1260 Infinity using a Shodex OHpak SB-806M HQ column (8 x 300 mm) followed by an Ultrahydrogel linear column (7.8 x 300 mm) maintained at 40°C using an eluent of 0.1 M $NaNO_3$ containing 5 mM NaN_3 and flow rate of 0.6 mL/min. An Infinity 1260 Triple Detector Suite from Agilent Technologies was used, consisting of a refractive index (RI) detector, a viscometer (VS) detector and a dual angle (90° and 15°) laser light scattering (LS) detector. Triple detection analysis was done using the Agilent GPC/SEC software (Version A:02:01). A refractive index increment (dn/dc) of 0.146 mL/g was used for the calculations.

Results

The results of the analyses are provided in the table below.

The parameters measured are:

Mp – peak molecular weight (g/mol)	– the molecular weight of the most abundant species in the sample.
Mw – weight average molecular weight	– the average molecular weight of the distribution based on the weight of particles in each fraction.
Mn – number average molecular weight	– the average molecular weight of the distribution based on number of particles in each fraction.
Pd – Polydispersity Index	– the ratio of Mw/Mn which is generally used as an indicator of the width of the distribution, with 1.0 representing monodisperse molecules.